

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
)	
Amendment of the Commission's Rules with)	GN Docket No. 13-185
Regard to Commercial Operations in the)	
1695-1710 MHz, 1755-1780 MHz, and 2155-)	
2180 MHz Bands)	
)	
)	
)	

To: Marlene H. Dortch
Office of the Secretary, Federal Communications Commission

COMSEARCH COMMENTS

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Date: September 18, 2013

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EXECUTIVE SUMMARY

Comsearch supports the Federal Communication Commission's (Commission) efforts to make more commercial spectrum available for Advanced Wireless Services (AWS). However, while the concept of repurposing Federal use spectrum is not new, there is still much work needed to ensure commercial systems can operate on a shared basis with Federal incumbents.

Comsearch supports the use of Protection Zones to promote sharing between commercial and Federal systems that cannot relocate before commercial licensees wish to deploy their systems. Protection Zones should be established for all Federal systems that are not relocating or that cannot relocate before commercial deployment commences. We recommend that complete information on all Protection Zones be made public and extensively described. Comsearch supports the Commerce Spectrum Management Advisory Committee (CSMAC) recommendations to further study and improve the technical assumptions and methodologies to determine the Protection Zones contained in the CSMAC reports that are focused on feasibility of spectrum sharing and relocation of incumbent systems operating in the AWS-3 bands.

We note that Transitional Sharing was successful in AWS-1 to promote commercial access to the spectrum before Federal systems are relocated and the same concept should be extended to AWS-3. If properly implemented, Transitional Sharing will permit deployment of commercial systems within Protection Zones before Federal systems have relocated. However, in order to be effective and workable, it is critical that all stakeholders collaborate on data-sharing, interference analysis methodologies and objectives, and interference reporting in order to perform sharing analyses between specific AWS-3 sites and Federal systems.

We support stakeholders' discussions on the establishment of a "Trusted Agent". The Trusted Agent would work to facilitate the spectrum identification, spectrum engineering and

sharing analyses of Federal systems to enable sharing analyses and discussions while protecting sensitive government and commercial information.

Clarification is needed between the DoD Alternative Proposal and the CSMAC WG4 report regarding Tactical Radio Relay (TRR) systems. Comsearch suggests the Commission confirm whether all TRR systems (including Army National Guard) will relocate as indicated in the DoD Alternative Proposal, or if any will remain operational in the 1755-1780 MHz band.

Finally, Comsearch supports the Commission extending the current AWS-1 relocation and cost sharing rules for both the FS in the 2160-2180 MHz band and the BRS in the 2150-2160/62 MHz band.

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COMSEARCH COMMENTS

In response to the above-mentioned *Notice of Proposed Rulemaking* (NPRM)¹,
Comsearch hereby submits the following comments.

I. INTRODUCTION

Comsearch supports the Federal Communication Commission's (Commission) efforts to make more commercial spectrum available for Advanced Wireless Services (AWS). We believe this NPRM is a significant step to address the burgeoning need for more spectrum in bands that generally harmonize with international allocations. However, while the concept of repurposing Federal use spectrum is not new, there is still much work to do to ensure commercial systems can operate on a shared basis with Federal incumbents.

¹ FCC 13-102, 28 FCC Rcd 11479, released July 23, 2013 (NPRM).

II. COMSEARCH BACKGROUND

Comsearch is a leading provider of spectrum management and wireless engineering products and services to the commercial and federal market. Since 1977, Comsearch has been actively engaged with Commission, the National Telecommunications Information Administration (NTIA), and various industry groups and standards organizations to develop rules, industry recommendations, and standards that promote the efficient use of the radio spectrum. Comsearch has extensive experience working with mobile, fixed point-to-point, point-to-multipoint, and satellite systems. Our solutions focus on key areas of spectrum management including frequency planning and administration, spectrum monitoring and interference measurements, wireless engineering, and strategic consultation. Our engineers, software products and information databases address the specific challenges of network design and spectrum management for the wireless industry in both the commercial and government sectors.

In addition to being an FCC-authorized TV White Space (TVWS) Database Administrator² and an FCC-certified 70-80-90 GHz Link Registration Database Administrator³, we support the American Society for Healthcare Engineering (ASHE) of the American Hospital Association as the WMTS frequency coordinator⁴, and we support CTIA—The Wireless Association[®] (CTIA) in the ongoing management of the CTIA AWS Cost-sharing

² See *Office of Engineering and Technology Invites Proposals from Entities Seeking to be Designated TV Band Device Database Managers*, ET Docket No. 04-186 (DA 09-2479) (Public Notice) 23 FCC Rcd 16807 (2008), and *Second Report and Order and Memorandum Opinion and Order*, (Order) ET Docket No. 04-186, ET Docket No. 02-380, 23 FCC Rcd 16807 (2008).

³ See *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, WT Docket No. 02-146, 18 FCC Rcd 23318 (2003); *Wireless Telecommunications Bureau Opens Filing Window For Proposals To Develop And Manage Independent Database Of Site Registrations By Licensees In The 71-76 GHz, 81-86 GHz and 92-95 GHz Bands* (DA 04-672).

⁴ See *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service, "Designated the American Society for Health Care Engineering of the American Hospital Association to serve as the frequency coordinator for the Wireless Medical Telemetry Service"*, ET Docket 99-255, 16 FCC Rcd 4543 (2001).

Clearinghouse⁵. We have developed numerous software products to address the engineering challenges of network planning, spectrum management, spectrum administration, band sharing and incumbent relocation.

As a result of these efforts, we have developed extensive expertise in RF interference analysis, interference troubleshooting and measurements, and propagation modeling.

Through our Comsearch Government Solutions (CGS) division, we provide innovative engineering products and services to the DoD and other Federal government agencies.

Leveraging over 35 years of expertise in spectrum management, EMI/EMC analyses, Radiation Hazard and E3 field measurement of wireless technologies, we support critical government missions in the areas of national defense, public safety, and homeland security. We also have extensive experience working with the federal spectrum management databases and systems.

Comsearch has participated heavily in the recent Commerce Spectrum Management Advisory Committee (CSMAC) work. In this capacity, we contributed to the efforts of Working Group 3, Satellite Control and Electronic Warfare (WG3); Working Group 4, Tactical Radio and Fixed Microwave (WG4); and Working Group 5, Airborne Operations (WG5).⁶

⁵ See *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems Service Rules for Advanced Wireless Services In the 1.7 GHz and 2.1 GHz Bands* (DA 07-1120) (ET Docket No. 00-258, WT Docket No. 02-353) (March 8, 2007) 22 FCC Rcd 4680.

⁶ We note that WG4 was also tasked with analyzing Joint Tactical Radio Systems (JTRS).

III. COMMENTS

1. Comsearch supports the use of Protection Zones to promote sharing between commercial and Federal systems that cannot relocate before commercial licensees wish to deploy their systems

Protection Zones are used extensively to promote sharing between services and systems. One example where Protection Zones are used is frequency coordination in the point-to-point microwave service.

In this case, Protection Zones (also called Coordination Contours or Coordination Zones) are defined as, “The area associated with a station outside of which another station sharing the same or adjacent frequency band neither causes nor is subject to interfering emissions greater than a permissible level.”⁷ Coordination Contours are used in the frequency coordination of point-to-point microwave systems to define the area within which coordination is necessary. This is more or less the same approach discussed in the NPRM.⁸ We strongly support the use of Protection Zones to promote sharing between commercial and Federal systems.

Protection Zones should be established for all Federal systems that are not relocating or that cannot relocate before commercial deployment commences. We recommend that complete information on all Protection Zones be made public and extensively described. This information should include (but not necessarily be limited to): controlling entity (i.e., military base or location), center point and radius for circular Zones, or GIS shape file (or .kml file) for irregularly shaped polygon zones.

However, before publishing Protection Zone information, it is important to study Protection Zone analysis methodologies with a goal of improving the assumptions and refining

⁷ See 47 C.F.R. §100.3 Definitions (we note the definition is for Coordination Contours).

⁸ NPRM at ¶15.

the approach used in the CSMAC reports. Indeed, both WG4 and WG5 indicated that further study is needed to refine the analyses with a goal of improving the assumptions and approach used in the analysis.⁹ Both WGs identified several analysis parameters that should be studied including improved propagation models, the use of clutter, antenna discrimination, operational time frames and interference protection criteria.¹⁰ Comsearch strongly suggests that these parameters and methodologies should be studied as recommended by the WGs, that consensus be reached on an appropriate approach to apply to all Protection Zone analyses, and that all Zones be re-analyzed with any changed parameters or methodologies.¹¹

⁹ See, *Commerce Spectrum Management Advisory Committee (CSMAC), Working Group 4: 1755-1850 MHz Point-to-Point Microwave, Tactical Radio Relay (TRR), Joint Tactical Radio System / Software Defined Radio (JTRS/SDR), Final Report*”, Filed July 23, 2013, Approved by CSMAC August 28, 2013 (<http://www.ntia.doc.gov/other-publication/2013/working-group-4-final-report-1755-1850-mhz-point-point-microwave>) AND “*Commerce Spectrum Management Advisory Committee (CSMAC), Working Group 5, 1755-1850 MHz Airborne Operations (Air Combat Training System, Small Unmanned Aircraft Systems, Precision-Guided Munitions, Aeronautical Mobile Telemetry), Final Report*” Filed July 23, 2013, Approved by CSMAC August 28, 2013 (<http://www.ntia.doc.gov/other-publication/2013/working-group-5-final-report-1755-1850-mhz-airborne-operations>).

¹⁰ WG4 report at §§4.2.3, 4.2.4 and 4.2.6 plus WG5 report at §1.3.

¹¹ We note that this is likely not necessary for microwave point-to-point systems, and we suggest the Commission refer to the National Spectrum Management Association, Recommendation WG 3.90.026, “Coordination Contours for Terrestrial Microwave Systems”, www.nisma.org.

Comsearch understands that many of the Federal systems that operate in the 1755-1850 MHz band are mission-specific and do not use a 100% operational duty cycle.¹² Results from a coordinated industry and DoD spectrum monitoring effort support this statement.¹³ Figure 1 below shows an example of the spectrum monitoring results.

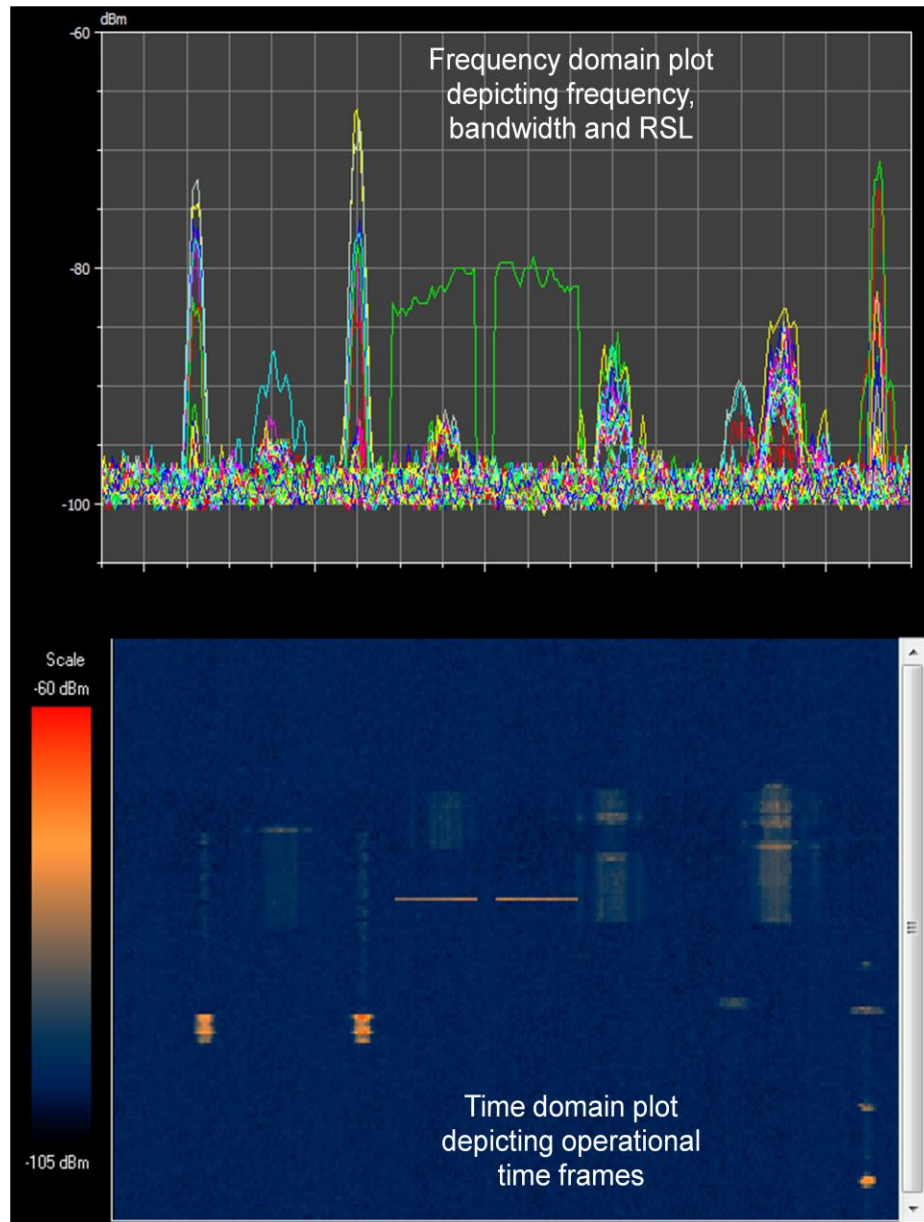


Figure 1: Plot of Spectrum Monitoring Results

¹² For example, see, “P5 Air Combat Training System, P5 ACTS, An Introduction” presentation to CSMAC WG-5, ACTS SWG, August 2, 2012, Slide 15. Mission lengths vary from 1.5 – 3 hours.

¹³ NPRM at ¶18.

Considering the operational duty cycle of Federal systems, Comsearch suggests that it is possible to take advantage of the periods where these systems are not operational and allow commercial systems to share the spectrum in the time domain. Accordingly, we fully support the Time-Base Sharing approach described in the WG-5 Final report.¹⁴

2. Transitional Sharing was successful in AWS-1 to promote commercial access to the spectrum before Federal systems are relocated and should be extended to AWS-3.

The NPRM describes the Transitional Sharing approach that was used successfully in AWS-1.¹⁵ Comsearch strongly recommends that a similar approach should be used for AWS-3 with improvements as recommended. If properly implemented, Transitional Sharing will permit deployment of commercial systems within Protection Zones before Federal systems have relocated. However, in order to be effective and workable, it is critical that all stakeholders collaborate on the following issues in order to perform sharing analyses between specific carrier sites and Federal systems:

- Sharing of data and safeguarding sensitive or classified information,
- Development of mutually-agreeable interference analysis methodologies,
- Utilization of a mutually-agreeable propagation model to predict losses of potential interfering signals,
- Development of mutually-agreeable interference objectives, and
- A process for interference reporting.

For AWS-1, the FCC and NTIA issued a joint Public Notice describing coordination procedures.¹⁶ Figure 2 below depicts a flow diagram of that process from the perspective of a frequency coordinator.¹⁷

¹⁴ WG5 report at §1.3.

¹⁵ NPRM at ¶67.

¹⁶ The Federal Communications Commission and the National Telecommunications and Information Administration—Coordination Procedures in the 1710-1755 MHz Band, *Public Notice*, 21 FCC Rcd 4730 (2006) (AWS-1 Coordination Procedures PN).

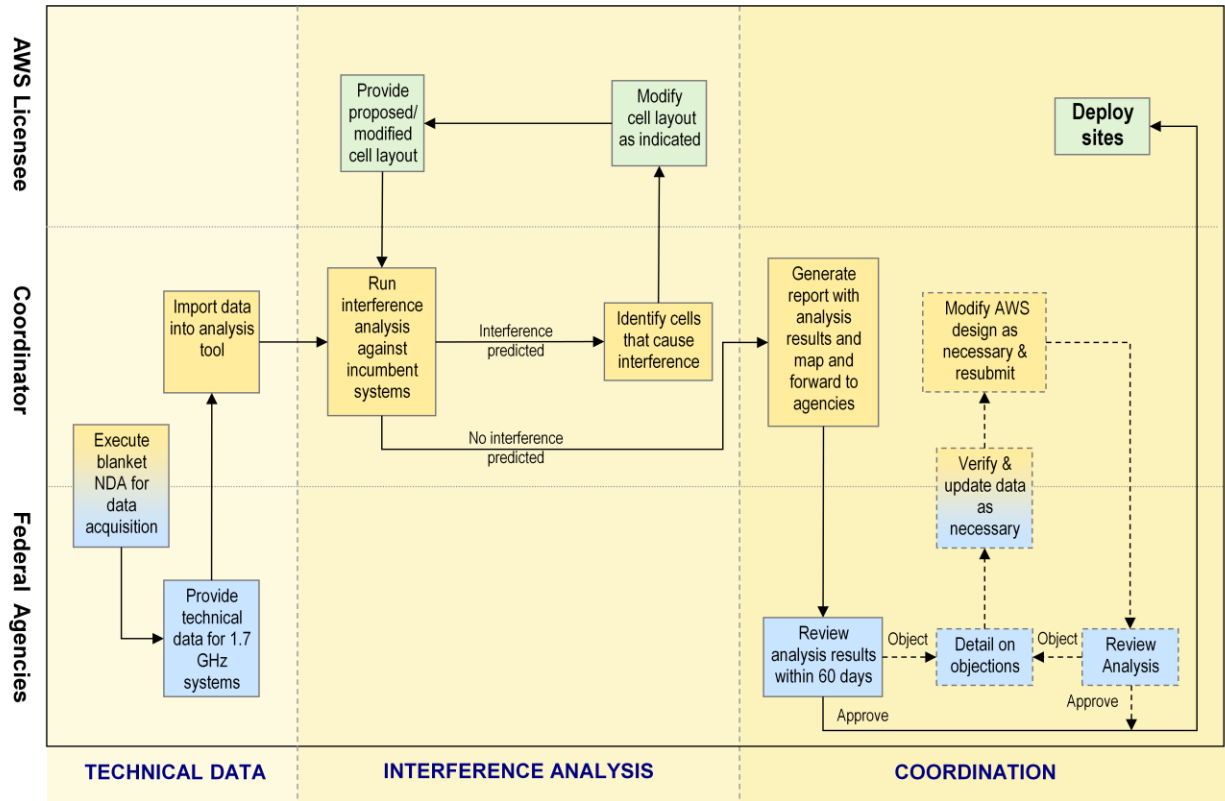


Figure 2: AWS-1 Coordination Flow Diagram

Figure 3 depicts the process for the DoD Defense Spectrum Management Relocation Activity (DSRMA).¹⁸ To expedite their AWS-1 relocation activities, DoD established a secure interactive portal for AWS licensees to submit a prior coordination notice on their market areas. Each AWS licensee was required to set up an account to access and submit data through the DoD portal. DoD performed analyses on the data and submitted results back to carriers through the portal. While the portal simplified the interaction with DoD, there was no visibility on the analysis process, specifically methods to mitigate interference. Each submission of data

¹⁷ We note that our role in this process was that of frequency coordinator, but the process is flexible for AWS licenses as well.

¹⁸ The Defense Spectrum Relocation Management Activity (DSRMA) was established to oversee the 1710-1755 MHz spectrum relocation process for all affected DoD systems. See "DSRMA AWS Band Sharing Request Process Flow". <http://www.disa.mil/Services/Spectrum/JSC-Joint-Spectrum-Center/~media/Files/DISA/Services/JSC/7-CoordinationProcess.pdf>.

typically required several (sometimes lengthy) rounds of interaction to achieve DoD approval of a coordination request.

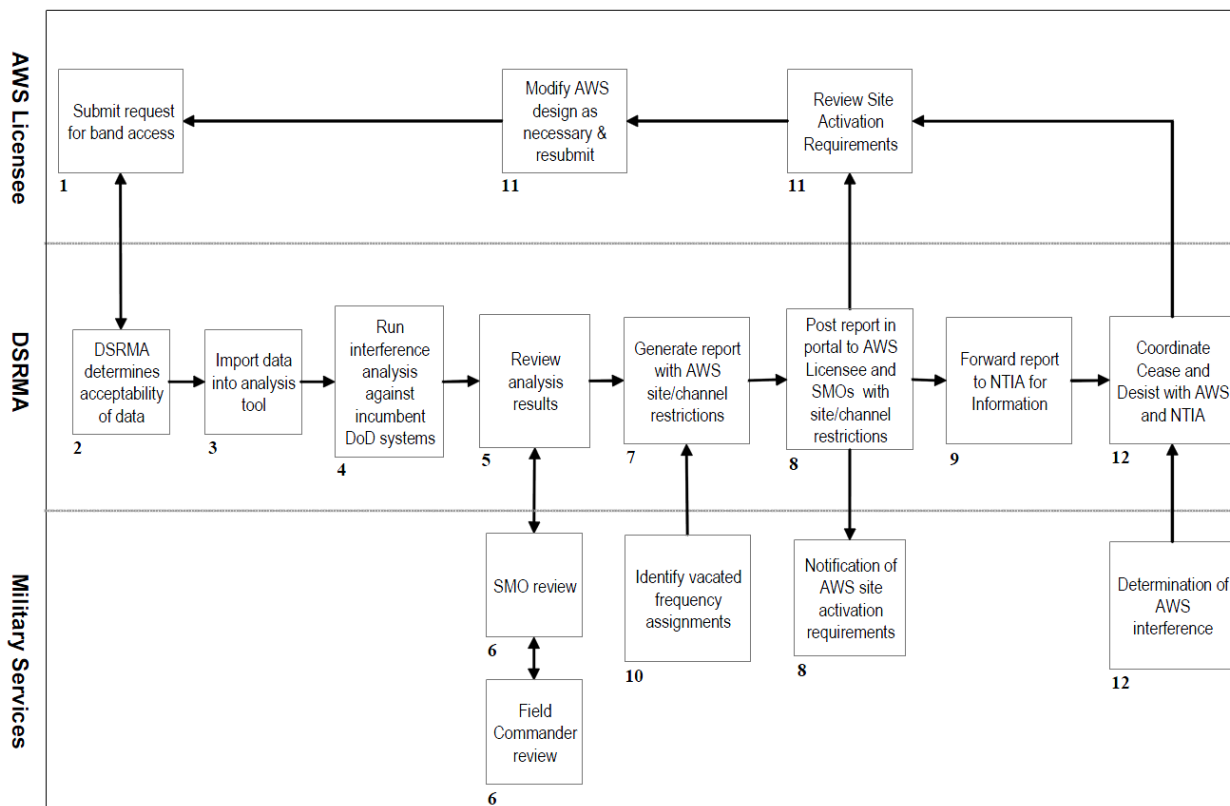


Figure 3: AWS-1 Coordination Process Flow Diagram for DoD

In general, both processes depicted above represent some level of industry and Federal agency collaboration.¹⁹ We note that for the most part, it was difficult to obtain data on Federal systems sufficient to perform independent interference analyses (DoD released no data on their systems). Each Federal agency approached the interaction with industry differently including the agency costs to engage before auction proceeds had been apportioned to agencies, as well as the release of data on their systems. Ultimately, industry and Federal agencies were able to inculcate some version of the processes depicted in Figures 2 and 3.

¹⁹ We note that CTIA held three Coordination Symposia to establish frameworks for working with Federal agencies to facilitate the processes described in the PN. Comsearch supported all three symposia, and also worked with all agencies to bring about a workable process.

As a coda to these efforts based upon recommendations from CSMAC²⁰, NTIA released a Notice of Inquiry seeking comments on what implementation steps should be retained as best practices, what lessons were learned, and what, if any, improvements should be made in future relocations under the Commercial Spectrum Enhancement Act (CSEA).²¹ Among the CSMAC recommendations were the following:

- Improve information dissemination so that potential applicants for reallocated spectrum will have a clear understanding of the technical requirements of incumbents and their relocation needs. For example, commercial entities must have sufficient information to fully understand whether commercial deployments will be possible before the Federal operations are fully relocated.
- Portal established by the Department of Defense should be used as the baseline model for exchanging information between Federal Government [all agencies] and commercial entities regarding relocation issues.
- Development of secure on-line capabilities that will allow, where feasible, for virtually instantaneous coordination between Federal and non-Federal systems operating on frequencies identified for relocation or sharing. This on-line database should build on the substantial success of NTIA's and the FCC's efforts in the 70-80-90 GHz bands.
- Centralize oversight responsibility for the relocation of Federal Government systems.

In addition to these recommendations, CSMAC WG4 made the following key recommendations:²²

“[WG4] also recommends that NTIA and FCC, in coordination with the affected Federal agencies and commercial wireless carriers, develop coordination procedures similar to AWS-1. These procedures should accommodate the following:

- Sharing data on TRR [Tactical Radio Relay] systems (e.g., assignments, operational characteristics, technical parameters, etc.) with commercial operators or their designees, to the extent information protection mandates are adhered to. The WG notes that this issue applies across all WGs.

²⁰ Commerce Spectrum Management Advisory Committee Transition Report, December 13, 2008

²¹ “*National Telecommunications and Information Administration [Docket No. 0906231085–91085–01] Relocation of Federal Systems in the 1710–1755 MHz Frequency Band: Review of the Initial Implementation of the Commercial Spectrum Enhancement Act*”, 74 FR 32131 (2009)

²² WG4 Recommendations, Section 4.2.6.

- Commercial licensees must be required to coordinate any operations that could permit mobile, fixed, and portable stations to operate in the specified Protection Zones.
- Commercial licensee operations within Protection Zones will be permitted following a successful coordination process concluding that such commercial operations will not cause any loss of capability due to harmful interference at the federal site plus certain other conditions.
- Protection of TRR facilities must continue until such time as these systems are relocated to other spectrum or compressed into 1780-1850 MHz.
- A process must be established to ensure that in the event of interference that can be sourced to commercial wireless operations, wireless operators modify operations in the band to mitigate interference until sources are identified and resolved. Commercial operators will need to provide and maintain 24/7 point of contact should interference occur. Federal incumbents will also need to provide a list of authorized personnel who can provide bona fide requests for the modification of commercial operations in identified protection zones.”

CSMAC WG5 made these key recommendations:²³

“The following section summarizes the recommendations from WG-5. More detail on specific SWG [sub working group] recommendations can be found in the individual SWG reports (see Section 3).

1. The recently agreed-upon mechanism for release of sensitive, but unclassified, information regarding the Federal systems in the band to industry representatives, and vice versa with respect to commercially sensitive information, via an appropriate mechanism that ensures protection of the information needs to be implemented to enable both industry and government to have access to the same information for discussions to assess next step options.
2. If it is determined that it would be useful to refine the technical feasibility analysis the SWGs conducted, an evaluation of the topics for further study outlined in the next steps/path forward section (Section 1.3) should be undertaken to determine which items should be assessed.”

The WG5 recommendation above refers to a, “recently agreed-upon mechanism for release of sensitive but unclassified information”. Comsearch suggests that while this process of mutual sharing of sensitive or unclassified data on industry and DoD systems may be appropriate in the case described above, it may be difficult to institutionalize for long-term sharing

²³ WG5 Recommendations, Section 1.2.

considering the need to adopt rules, processes and broad-scale methods for sharing of these types of data. Accordingly, we recommend that all stakeholders collaborate on the establishment of a “Trusted Agent” entity who can:

- Act as an impartial data clearinghouse,
- Provide a forum for industry and government stakeholders to address sharing issues
- Perform analyses based on agreed-upon methodology, and
- Protect both government data (including classified) and commercial proprietary information.

The role of the Trusted Agent would be to facilitate the spectrum identification, spectrum engineering and sharing analyses of Federal systems to enable sharing analyses and discussions while protecting sensitive government and commercial information. We envision the Trusted Agent’s responsibilities as vital in promoting Transitional Sharing to permit access to Federal spectrum before Federal systems are relocated.

3. Clarification is needed between the DoD Alternative Proposal and the WG4 report regarding Tactical Radio Relay systems.

Item 4 in the DoD Alternative Proposal indicates:

“DoD will modify selected systems to operate at both 1780- 1850 MHz & 2025-2110 MHz. These include Small Unmanned Aerial Systems, Tactical Targeting Network Technology, Tactical Radio Relay, and High Resolution Video systems”.²⁴

However, the WG4 report indicates:

“The following highest priority training DoD [TRR] installations/locations would require Protection Zones indefinitely.”²⁵

²⁴ NPRM at ¶79.

²⁵ WG4 Report at Section 2.2.3.

Continuing Army TRR Locations

Fort Irwin, CA
 Fort Polk, LA
 Fort Bliss; TX and WSMR
 Fort Hood, TX
 Fort Bragg, NC (Includes Camp MacKall)
 Yuma Proving Ground, AZ

Continuing USN/USMC TRR Locations

Bogue Field, NC
 Panama City, FL
 MCAS Yuma, AZ
 Twenty-Nine Palms, CA
 MCB Camp Pendleton, CA
 MCB Hawaii (Kaneohe Bay), HI
 Apra Harbor, Guam

The WG4 Report also indicates:

“Army National Guard statewide assignments would be replaced with point or local area assignments at the National Guard base locations as follows:”

<u>State</u>	<u>Cities With Continued TRR Operation</u>
Arizona	Casa Grandee, Papago Mine, Chandler, Marana, Phoenix
Illinois	Chicago, Carbondale, Crestwood, Marion, Kewanee, North Riverside, Springfield
Indiana	Elwood, Anderson, Greenfield, Indianapolis
Iowa	Cedar Rapids, Johnston
Michigan	Adrian, Augusta, Wyoming
Mississippi	Meridian, Camp Shelby
Missouri	Warrensburg, Whiteman, Kansas City, Saint Joseph, Fort Leonard Wood
North Dakota	Fargo, Devils Lake
Ohio	Newark, Springfield, Columbus
Oklahoma	Norman, Mustang, Oklahoma City
New Hampshire	Manchester, Strafford
Pennsylvania	York, Johnstown, Tobyhanna, Harrisburg, Annville

We recommend the Commission confirm whether all TRR systems (including Army National Guard) will relocate as indicated in the DoD Alternative Proposal, or if any will remain in the 1755-1780 MHz band necessitating a Transitional Sharing approach.

4. The Commission should extend the current relocation and cost sharing rules for both the FS in the 2160-2180 MHz band and the BRS in the 2150-2160/62 MHz band.

Comsearch agrees with the Commission’s proposal to extend the current relocation and cost sharing rules for both FS in the 2160-2180 MHz band and BRS in the 2150-2160/62 MHz

band.²⁶ The Commission correctly notes that the 2160-2180 MHz band is paired with the 2110-2130 MHz band, which is subject to relocation and cost sharing under the AWS-1 rules.²⁷ New AWS-3 licensees will face practically the same relocation issues faced by current AWS-1 licensees given that there are still over 120 FS microwave links and 4 BRS systems remaining in the bands, so it seems reasonable that the incumbent protection and relocation rules of 47 C.F.R §§ 27.1111-1132 should be applicable to AWS-3.²⁸

Considering cost sharing, we note that the Commission states cost sharing was established to address the case where relocation of an incumbent system benefits more than one AWS licensee. The CTIA Spectrum Clearinghouse reported the following statistics in their recent semi-annual report:²⁹

CTIA SPECTRUM CLEARINGHOUSE, LLC DATA As of June 30, 2013		
Category	Totals 1/1/13 – 6/30/13	Lifetime Totals
Links Relocated	61	1642
Aggregate Amount Paid	\$7,420,692	\$306,361,174
Average \$/Link	\$121,651	\$186,578

These statistics show that over 1600 links have been relocated since the establishment of cost sharing for AWS in 2006. Clearinghouse data show that over 70 BRS systems have also been relocated. Accordingly, since new AWS-3 licensees will benefit from these relocations, cost sharing should be established in the AWS-3 band.

²⁶ NPRM at ¶ 162.

²⁷ 47 C.F.R. §§ 27.1111-1190

²⁸ Our records indicate that there are still 122 licensed FS microwave links in the 2160-2180 MHz band and 4 licensed BRS systems remaining in the 2150-2160/62 MHz band.

²⁹ See, “Report of the CTIA Spectrum Clearinghouse”, ET 00-258, July 31, 2013.

IV. CONCLUSIONS

Comsearch supports the Commissions desire to make additional spectrum available for AWS. However, it is important to fully describe and publish all Protection Zones and establish mutually-agreeable methods to support Transitional Sharing among stakeholders. We believe that the establishment of an entity to act as a “Trusted Agent” would greatly facilitate sharing and relocation efforts.

It is also advisable to extend AWS-1 relocation and cost sharing requirements to the new AWS-3 band as there are still systems to be relocated, and new AWS-3 licensees would benefit from relocations already completed with the deployment of AWS-1 systems.

We are eager to participate with all stakeholders to ensure AWS licensees are able to utilize new, albeit repurposed spectrum for commercial operations while protecting incumbent Federal users.

Respectfully Submitted,

/s/ Christopher R. Hardy

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Date: September 18, 2013